

**Staff Report
for*****Item 5
May 5, 2005*****To: John H. Robertus
Executive Officer****From: Hashim Navrozali
Water Resource Control Engineer
Industrial Compliance Unit****Further Discussion of Modifications to
Tentative Order Nos. R9-2005-0005 and R9-2005-0006****SUMMARY OF MODIFICATIONS**

Based on oral and written comments received, Regional Board staff deemed it appropriate to make revisions to the initial versions of the tentative Orders and add more details to the Fact Sheet. An *Errata Sheet* reflecting the changes is included as part of this Supplemental Agenda Mailing (see Supporting Document No. 20).

Following is further discussion of some of the modifications made to the tentative Orders and Fact Sheet:

1. Effluent Limitation for Total Residual Chlorine

The instantaneous maximum total chlorine residual effluent limitation of 176 ug/l in the initial version of the tentative Orders was based on a maximum chlorination cycle time of 25 minutes. Although the normal chlorination cycle time at Units 2 and 3 is 25 minutes, SCE indicated (in its letter dated February 24, 2005) that it would like the flexibility to change chlorination cycle times to treat different degrees of biofouling in its condensers.

Based on SCE's request, Regional Board staff deemed it appropriate to remove the fixed instantaneous maximum limitation of 176 ug/l for total residual chlorine. The effluent limitation established by the tentative Orders will now be a variable value that is a function of the chlorination cycle time. This is consistent with the equation in *note c.* of Table B of the 2001 Ocean Plan for intermittent chlorine discharges. Based on this equation, a longer chlorination cycle time would render a lower (i.e. more stringent) effluent limitation for total residual chlorine. Conversely, a shorter chlorination cycle time would render a higher (i.e. less stringent) effluent limitations for total residual chlorine. For example a 40-minute chlorination cycle time would result in an effluent limitation for total residual chlorine of 142 ug/l (compared to 176 ug/l, for a cycle time of 25 minutes). Conversely a 20-minute chlorination cycle time would result in an effluent limitation for total residual chlorine of 191 ug/l (compared to 176 ug/l, for a cycle time of 25 minutes). The equation provides adequate protection of aquatic species from total residual chlorine impacts. The revised (variable) effluent limitation is consistent with that used in Order Nos. 99-47 and 99-48.

2. Chronic Toxicity Screening Schedule

The initial version of the MRP required SCE to conduct a screening study for chronic toxicity immediately upon adoption of the new Orders. As part of the screening study the discharger is required to conduct toxicity tests on approved species of an invertebrate, a plant, and a vertebrate and select the most sensitive species for subsequent whole effluent chronic toxicity tests on the effluent from Units 2 and 3. Since SCE just recently completed a chronic toxicity screening study on the discharges from Units 2 and 3 during the fourth quarter of 2004, SCE requested that the initial chronic toxicity screening for the renewed permits be deferred until the fourth quarter of 2006.

The Regional Board deemed that the request for SCE to defer the next chronic toxicity screening study for Units 2 and 3 until the fourth quarter of 2006 is reasonable since a screening study was already conducted in 2004.

3. Background Information Regarding Compliance with CWA Section 316(b) Requirements

The Fact Sheet to the tentative Orders was modified to provide more background information regarding current and historical compliance of SONGS with the requirements of CWA Section 316(b). The initial versions of the tentative Orders did not provide a detailed background discussion regarding compliance with CWA 316(b) requirements.

CWA Section 316(b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the Best Technology Available (BTA) for minimizing adverse environmental impact. The U.S. EPA published a final Phase II rule [Section 125.94(a)] to implement Section 316(b) in February 2004. The final rule became effective September 7, 2004 and specifies the location, design, construction, and capacity standards for cooling water intake structures.

The Phase II rule allows the discharger up to three and a half years to demonstrate compliance. The provisions, compliance requirements, and compliance schedules to demonstrate compliance with the Phase II rule have been incorporated into the tentative Orders. SCE is required to perform and implement a *Comprehensive Demonstration Study* (Study) to characterize impingement mortality and entrainment, to describe the operation of the cooling water intake structures at SONGS Unit Nos. 2 and 3, and to confirm that the technologies, operational measures, and/or restoration measures it has selected or installed, or will install, to meet one of the five compliance alternatives listed in Section 125.94(a) of the new rule.

The Study will also include implementation schedules for technological upgrades and/or restoration measures that would enable the facility to come into compliance with the rule.

SCE has already implemented or is in the process of implementing various structural (intake velocity caps, fish return system etc.) and mitigation measures (kelp reef construction, wetland habitat enhancement at San Dieguito Lagoon etc.) at SONGS. These measures were required as part of a permit (No. 6-81-330-A) issued to SONGS by the California Coastal Commission (CCC). The CCC required SONGS to implement

these measures based on recommendations by the Marine Review Committee (MRC) based on its studies conducted over a period of 15 years (1974 – 1989).

In its 1994 report on compliance of SONGS with Section 316(b) requirements, the U.S. EPA stated that although the MRC studies indicated adverse localized impacts to larval fish because of entrainment in the SONGS intake structures, the mitigation requirements recommended by the MRC (and incorporated into CCC's permit) in conjunction with the existing velocity caps and fish return system would be adequate in meeting Section 316(b) compliance requirements.

The Fact Sheet was modified to include a more detailed discussion of MRC's findings and recommendations and the measures SONGS has implemented to mitigate adverse impacts from its intake structures.

It would not be feasible to require the power plant to make additional significant upgrades prior to the submittal of the Study. In the interim, therefore, it is appropriate for SONGS to continue operating in its current configuration.

4. Discharge and Intake Locations and Receiving Water Monitoring Stations

A more clear and detailed schematic showing the relative locations of the discharge outfalls for Unit Nos. 2 and 3 (Outfalls 002 and 003), across-the-beach discharge (Outfall 004), fish return system outfall (005) and intake structures was added to Attachment A (SONGS Locations Map and Facility Diagram) of the tentative Orders. The initial versions of the tentative Orders did not include good quality maps showing the discharge locations and intake structures.

In order to better identify the location of the receiving water monitoring stations, the coordinates (LAT/LONG) of the receiving water monitoring stations were added to Figure 1 (*Continuous Temperature Monitoring Stations*) and Figure 4 (*Temperature Profile and Water Quality Measurement Stations*) to the Monitoring and Reporting Program. This provides a better description of the location of the water quality monitoring stations (for measurement of temperature, dissolved oxygen, and other water quality parameters) relative to each other and to the diffuser locations of Unit Nos. 2 and 3. The initial version of Figures 1 and 4 did not include the coordinates of the receiving water monitoring stations.

In order to better identify the location of the fish trawling station sites, Figure 2 (*Otter Trawl Stations for Fish Population Study*) to the MRP was modified to include better identifiers for the stations in the vicinity of the SONGS discharge and the stations at the control sites (i.e. reference sites that are not influenced by the SONGS discharge). The initial version of Figure 2 did not provide labels/identifiers to distinguish between control and discharge fish trawl sites.

5. Background Information Regarding SONGS Diffuser Design and Initial Dilution Factor Studies

The Fact Sheet was modified to include a discussion on the design of the SONGS diffusers and a graphic representation of their effectiveness at a Delta T of 25 degrees F. The initial version of the tentative Orders did not provide a detailed description on the diffuser design and function. The Fact Sheet was also expanded to include descriptions of studies conducted at SONGS to determine the Zones of Initial Dilution (ZIDs) and initial dilution factor associated with Outfalls 002 and 003.

The outfalls for Unit Nos. 2 and 3 (i.e. Outfalls 002 and 003) were specifically designed by the California Institute of Technology (Caltech) in the 1970s to prevent warmer effluent from being recirculated into the SONGS intake structures in order to maximize the efficiency of the steam condensers. The design also ensured compliance with Thermal Plan receiving water limitations. Integral to this design are the 2500 foot-long diffusers (associated with Outfalls 002 and 003), each incorporating 63 separate discharge ports angled upward and offshore to increase effluent discharge velocity and ensure that heated effluent actively travels away from the near shore intakes. The design and offset location of the diffusers associated with Unit Nos. 2 and 3 ensure that the ZIDs of Outfalls 002 and 003 do not overlap or impinge upon one another. This fact has been verified by comprehensive hydraulic modeling of the discharge plumes by the Marine Review Committee in the 1980s.

6. Description and Efficiency of SONGS Fish Return System

The Fact Sheet was modified to include a more detailed description of the design and function of the SONGS fish return system. The Fact Sheet was also expanded to include the findings of studies conducted by the National Marine Fisheries Service (NMFS) in the 1980s to determine the efficiency of the fish return system in reducing impingement losses of adult fish at the Units 2 and 3 intake screens. The initial version of the tentative Orders did not include a detailed discussion on the fish return system and its ability to reduce fish impingement losses.

Studies on the efficiency of the fish return system at SONGS were conducted during 1985-86 by the NMFS. A "corral" net was deployed at the end of the Fish Return System outfall and monitored by divers to document the survival of fish returned to the ocean. A total of fourteen 96-hour samples were collected (six from Unit No. 2 and eight from Unit No. 3). In its 1989 report, *Analysis of Fish Diversion Efficiency and Survivorship in the Fish Return System at San Onofre Nuclear Generating Station*, the NMFS concluded that the fish return system allowed 80 – 95 percent of most species of fish to be diverted back to the ocean instead of being impinged on the intake screens.